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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,360	09/19/2006	Saburou Yamagata	MOR-270-A	1223
Andrew R Basile ⁷⁵⁹⁰ 09/13/2010				
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EXAMINER				
YANG, JIE				
ART UNIT		PAPER NUMBER		
1793				
MAIL DATE		DELIVERY MODE		
09/13/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/593,360

Applicant(s)

YAMAGATA ET AL.

Examiner

JIE YANG

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1.5-10, 12 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1.5-10, 12 and 14-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/19/2010 has been entered.

Status of the Claims

Claims 1, 10, and 16 are amended, claims 2-4, 11, and 13 are cancelled, and claims 1, 5-10, 12, and 14-16 are pending in application.

Status of the Previous Rejections

Previous rejection of claim 16 under 35 U.S.C. 102(b) as anticipated by Kazuo (JP 2000-239738, thereafter JP'738) is withdrawn in view of the applicants' amendment/remarks marked 4/19/2010. However, in view of the amendment, a new ground(s) of rejection is made (see below).

Previous rejection of claims 1, 5-7, and 10 under 35 U.S.C. 103(a) as being unpatentable over JP'738 in view of Okuda Motoshige (JP 05-017817, thereafter JP'817) is withdrawn in view of the applicants' amendment/remarks marked 4/19/2010. However, in view of the amendment, a new ground(s) of rejection is made (see below).

Claim Objections

Claim 12 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. In the instant case, claim 12, which depends on claim 10, includes substantially identical limitations as recited in the instant claim 10.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

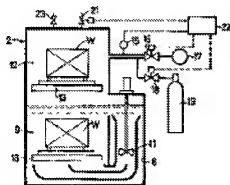
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5-10, 12, and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuo (JP 2000-239738, thereafter JP'738) in view of Okuda Motoshige (JP 05-017817, thereafter JP'817) and Saburo et al (JP 2003-286517, thereafter JP'517).

Regarding claims 1 and 10, JP'738 teaches feeding the heated work piece into hardening agent (paragraph [0001] of JP'738) with vibration generating in a quenching tub in order to affect the vapor film (Abstract, paragraphs [0005], [0010], and fig.1 of JP'738), which reads on the cooling heated metal parts,

breaking the vapor film by repeated varies pressure using oscillations devices as recited in the instant claims. JP'738 teaches the position between oscillating devices and work piece is adjustable in order to remove the vapor film efficiently (paragraphs [0010]-[0011] of JP'738) and JP'738 teaches that this oscillatory wave is not the oscillation of only the direction of a vertical but the wave of a three dimension at least (Paragraph [0023] of JP'738), which covers the horizontally and reciprocally moving oscillating devices in the cooling agent as recited in the instant claims because JP'738 teaches that the oscillating device include vibrating motor, shaft, and wings, and JP'738 teaches that the shaft and wings generate oscillatory wave in the cooling agent (Fig. 1 and Paragraphs [0022]-[0023] of JP'738). JP'738 further teaches an oscillatory three dimensional wave (repeatedly varying pressure) in the direction of a vapor film covering a work piece propagated through a quenching agent (Abstract, paragraph [0023] of JP'738). The application of repeatedly varying pressure in the form of a three dimensional wave would inherently result in a change of the pressure applied to the liquid level of the cooling liquid as recited in the instant claims. JP'738 does not specify to introduce a gas above the liquid surface level via a gas introduction pipe as recited in the instant claims. JP'817

teaches a method for hardening treatment (Abstract of JP'817). JP'817 teaches pressure control through opening and closing of a supply valve and the gas has been introduced above the liquid surface level as shown in the following Fig. Therefore, it would have been obvious to one skilled in the art to apply gas above the liquid surface as demonstrated by JP'817 in the process of JP'738 in order to control the atmosphere pressure in the hardening chamber (Abstract of JP'817).



Regarding the limitation of stirring the cooling liquid with the stirrer after the vapor film begins to break as recited in the instant claims 1 and 10, JP'738 clearly teaches that the steam film breaking can fall directly to a work piece, which makes the cooling rate of the work piece fall and causes dispersion in the quality of quenching (Paragraph [0002] of JP'738). However, JP'738 in view of JP'817 does not specify the further stirring the cooling liquid after the vapor film begins

to be broken as recited in the instant claims. JP'517 teaches a quenching method of applying a jet stirring to a liquid coolant after applying oscillations with a vibration stirring to liquid coolant in order to uniformly remove the vapor film (Abstract, claim 1, paragraphs [0008] and [0044] of JP'517). JP'517 teaches the jet stirring starting time is controllable and JP'517 provides different jet stirring modes (Fig.4-9 and paragraphs [0007]-[0020] of JP'517) with different cooling results (Fig.12-20 of JP'517). Therefore, it would have been obvious to one skilled in the art to apply jet stirring and control the starting time of the jet stirring, for example after the vapor film begins to break as taught by JP'517 in the process of JP'738 in view of JP'817 in order to control the fluctuation of the cooling power to obtain the desired cooling results (Abstract and Fig.12 of JP'517).

Regarding claims 5-7, JP'738 teaches using multiple oscillation devices (Fig. 1, 2, and 5 of JP'738) as claimed in the instant claim 5, JP'738 teaches adjusting the frequency of the oscillation devices (Abstract, paragraph [0023] of JP'738), which reads on the limitations of the instant claims 6 and 7.

Regarding claims 8, 9, and 12, JP'738 in view of JP'817 and JP'517 teaches further stirring the cooling liquid after the vapor film begins to be broken as discussed in the rejection for

the instant claims 1 and 10 above. JP'517 teaches that applying jet stirring in boil stage causes diffusion to uniformly remove steam film (paragraphs [0017]-[0018] of JP'517), which reads on the limitation of bubbles formed by the breakage of the vapor film being caused to diffuse in the cooling agent (claim 8). JP'517 teaches the flow of the jet in jet stirring set to $5\text{m}^3/\text{hr}$. and the stirring intensity can be changed according to the shape and construction material of the work hardened (Fig. 10, paragraphs [0020], [0033] and [0039] of JP'517), which reads on the limitation of adjusting intensity of stirring as recited in the instant claim 9. Therefore, it would have been obvious to one skilled in the art to apply jet stirring and control the diffusing and stirring intensity as taught by JP'517 in the process of JP'738 in view of JP'817 in order to control the fluctuation of the cooling power to obtain the desired cooling results (Abstract and Fig.12 of JP'517).

Regarding claims 14 and 15, JP'738 does not specify the limitation of the gas introducing and exhausting as recited in the instant claims, JP'817 teaches pressure control through opening and closing of a supply valve and JP'817 teaches that the gas has been introduced above the liquid surface level and exhausted after cooling (Fig.2, paragraphs [0013]-[0014] of JP'817). Therefore, it would have been obvious to one skilled in

the art to control gas as demonstrated by JP'817 in the process of JP'738 in order to control the atmosphere pressure in the hardening chamber (Abstract of JP'817). JP'738 in view of JP'817 does not specify introducing gas directly into the cooling liquid as recited in the instant claims, JP'517 teaches that the jet stirring with flow jet blew off from rocket engine jets into an upflow which goes above the low part of the cooling pool (Fig. 1, paragraph [0025] of JP'517), which reads on the limitation of the gas directly introducing into cooling liquid as recited in the instant claims. Therefore, it would have been obvious to one skilled in the art to introduce gases directly into cooling liquid as taught by JP'517 in the process of JP'738 in view of JP'817 in order to control the fluctuation of the cooling power to obtain the desired cooling results (Abstract and Fig.12 of JP'517).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'738 in view JP'517.

Regarding claim 16, JP'738 teaches feeding the heated work piece into hardening agent (paragraph [0001] of JP'738) with vibration generating in a quenching tub in order to affect the vapor film (Abstract, paragraphs [0005], [0010], and fig.1 of JP'738), which reads on the cooling heated metal parts and

breaking the vapor film by repeated varies pressure using oscillations devices as recited in the instant claim. JP'738 teaches the position between oscillating devices and work piece is adjustable in order to remove the vapor film efficiently (paragraphs [0010]-[0011] of JP'738) and JP'738 teaches that this oscillatory wave is not the oscillation of only the direction of a vertical but the wave of a three dimension at least (Paragraph [0023] of JP'738), which covers the horizontally and reciprocally moving oscillating devices in the cooling agent as recited in the instant claims because JP'738 teaches that the oscillating device include vibrating motor, shaft, and wings, and JP'738 teaches that the shaft and wings generate oscillatory wave in the cooling agent (Fig. 1 and Paragraphs [0022]-[0023] of JP'738). JP'738 further teaches an oscillatory three dimensional wave (repeatedly varying pressure) in the direction of a vapor film covering a work piece propagated through a quenching agent (Abstract and paragraph [0023] of JP'738). The application of repeatedly varying pressure in the form of a three dimensional wave would inherently result in a change of the pressure applied to the liquid level of the cooling liquid as recited in the instant claim. Regarding the limitation of stirring the cooling liquid with the stirrer after the vapor film begins to break as recited

in the instant claim, JP'738 clearly teaches that the steam film breaking can fall directly to a work piece, which makes the cooling rate of the work piece fall and causes dispersion in the quality of quenching (Paragraph [0002] of JP'738). However, JP'738 does not specify the further stirring the cooling liquid after the vapor film begins to be broken as recited in the instant claim. JP'517 teaches a quenching method of applying a jet stirring to a liquid coolant after applying oscillations with a vibration stirring to liquid coolant in order to remove the vapor film (Abstract, claim 1, paragraphs [0008] and [0044] of JP'517). JP'517 teaches the jet stirring starting time is controllable and provides different jet stirring mode (Fig.4-9 and paragraphs [0007]-[0020] of JP'517) with different cooling results (Fig.12-20 of JP'517). Therefore, it would have been obvious to one skilled in the art to apply jet stirring and control the starting time of the jet stirring, for example after the vapor film begins to break as taught by JP'517 in the process of JP'738 in order to control the fluctuation of the cooling power to obtain the desired cooling results (Abstract and Fig.12-20 of JP'517).

Response to Arguments

Applicant's arguments with respect to claims 1, 5-10, 12, and 14-16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-2701884. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-2721244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jie Yang/
Patent Examiner, Art Unit 1793